

T7 primer										TAAATACGACT										TAGGG AGACCGG										AAG CTT										AAG GTG CAC GGC CCA CGT G										ATC GCG CGC										AGA TCT										TCG 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EDDIIIATKNGKVRGMNLTVFGGTVTAFLGIPYAQPPLGRLRFKKPQSLTK  
WSDIWNATKYANSCCQNIDQSFPGFHGSEMWNNPNTDLSEDCLYLN VWIPAP  
KPKNATVLIWIIYGGGFOTGTSSSLHVYDGKFLARVERVIVVSMNYRVGALGF  
LALPGNPEAPGNMGLFDQQLALQWVQKNIAAFGGNPKSVTLFGESAGAASV  
SLHLLSPGSHSLFTRAILQSGSFNAPWAVTSLYEARNRTLNLAKLTGCSRE  
NETEIIKCLRKNKDPQEILLNEAFVVPYGTPLSVNFGPTVDGDFLTDMPDIL  
LELGQFKKTQILVGVNKDEGTAFLVYGAPGFSKDNNSIITRKEFQEGLKIF  
FPGVSEFGKESILFHYTDWVDDQRPENYREALGDVVG DYNFICPALEFTKK  
FSEWGNNAFFYYFEHRSSKLPWPEWMGVMHGYEIEEFVFG LPLERRDNYTKA  
EEILSR SIVKRWANFAKYGNPNETQNNSTSWPVFKSTEQKYLT LNTESTRI  
MTKLRAQQCRFWTSFFPKVLEMTGNIDEAEWEWKAGFHRWNNYMMDWKNQF  
NDYTSKKESCVGL

FIGURE 2

```

1  tactgaatgt cagtcagtc caatttacag gctggagcag cagctgcctc ctgcatttcc
61  ccgaaglatt acatgatttt cactccttgc aaactttacc atctttgttg cagagaatcg
121 gaaatcaata tgcatagcaa agtcacaatc atatgcatca gatttctctt ttggtttctt
181 ttgctctgca tgcttattgg gaagtcacat actgaagatg acatcataat tgcacaaaag
241 aatggaaaag tcagagggat gaacttgaca gtttttgggtg gcacggtaac agcctttctt
301 ggaattccct atgcacagcc acctcttggt agacttcgat tcaaaaagcc acagtctctg
361 accaagtggg ctgatatttg gaatgccaca aaatatgcaa attcttgctg tcagaacata
421 gatcaaagtl ttccaggctt ccatggatca gagatgtgga acccaaacac tgacctcagt
481 gaagactggt tatatctaaa tgtatggatt ccagcaccta aacccaaaaa tggcactgta
541 ttgatatgga tttatgggtg tggttttcaa actggaacat catctttaca tgtttatgat
601 ggcaagtttc tggctcgggtg tgaaagagtt attgtagtgt caatgaacta taggggtgggt
661 gccctaggat tcttagcttt gccaggaaat cctgaggctc cagggaacat ggggtttattt
721 gatcaacagt tggctcttca gtgggttcaa aaaaatatag cagccttttg tggaaatcct
781 aaaagtgtaa ctctctttg agaaagtgca ggagcagctt cagttagcct gcatttgctt
841 tctctgggaa gccattcatt gttcaccaga gccattctgc aaagtggatc ctttaatgct
901 ccttggggcg taacatctct ttatgaagct aggaacagaa cgttgaactt agctaaattg
961 actggttgct ctagagagaa tgagactgaa ataatcaagt gtcttagaaa taaagatccc
1021 caagaaattc ttctgaatga agcatttggt gtcccctatg ggactccttt gtcagtaaac
1081 tttggtccga ccgtggatgg tgattttctc actgacatgc cagacatatt acttgaactt
1141 ggacaattta aaaaaacca gattttgggtg ggtgttaata aagatgaagg gacagctttt
1201 ttagtctatg gtgctcctgg cttcagcaaa gataacaata gtatcataac tagaaaaaaa
1261 ttccaggaag gtttaaaaaa attttttcca ggagtgaagt aaaactaccg tgaggccttg
1321 ctttttcatt acacagactg ggtagatgat cagagacctg tggagtccac caagaagttc
1381 ggtgatgttg ttggggatta taatttcata tgccctgcct tggagtccac caagaagttc
1441 tcagaatggg gaaataatgc ctttttctac tattttgaac accgatcctc caaacttccg
1501 tggccagaat ggatgggagt gatgcatggc tatgaaattg aatttgcctt tgggttacct
1561 ctggaaaaga gagataatta caaaaagcc gaggaattt tgagtagatc catagtgaag
1621 cggtgggcaa attttgcaaa atatgggaat ccaaatagag ctcagaacaa tagcacaagc
1681 tggcctgtct tcaaaagcac tgaacaaaaa tatctaacct tgaatacaga gtcaacaaga
1741 ataatgacga aactacgtgc tcaacaatgt cgattctgga catcattttt tccaaaagtc
1801 ttggaaatga caggaaatat tgatgaagca gaatgggagt ggaaagcagg attccatcgc
1861 tggacaattt acatgatgga ctggaaaaat caatttaacg attacactag caagaaagaa
1921 agttgtgtgg gtctctaatt aatagattta ccctttatag aacatatttt cctttagatc
1981 aaggcaaaaa tatcaggagc ttttttacac acctactaaa aaagttatta tgtagctgaa
2041 acaaaaatgc cagaaggata atattgattc ctacatctt taacttagta ttttacctag
2101 catttcaaaa cccaaatggc tagaacatgt ttaattaaat ttcacaatat aaagttctac
2161 agttaattat gtgcatatta aaacaatggc ctggttcaat ttctttcttt ccttaataaa
2221 tttaagtttt ttcccccaa aattatcagt gctctgcttt tagtcacgtg tattttcatt
2281 accactcgta aaaaggtatc ttttttaaat gaattaaata ttgaaacact gtacaccata
2341 gtttacaata ttatgtttcc taattaaaaa aagaattgaa tgtcaatatg agatattaaa
2401 ataagcacag aaaatc

```

Figure 3. Nucleic acid sequence of human butyrylcholinesterase (SEQ ID NO: 16)  
Genbank accession number M16541.

FIGURE 3

					1	10	20	30
human wild-type BChE					EDDIIIIATKN	GKVRGMNLT	TV FG	GGTVTAFLG
human A variant BChE					-----	-----	-----	-----
human J variant BChE					-----	-----	-----	-----
human K variant BChE					-----	-----	-----	-----
rat BChE					EEDVIIITTKT	GRVRLSMPI	LG	GGTVTAFLG
cat BChE					EEDIIITTKN	GKVRGMNLPV	LD	GGTVTAFLG
horse BChE					EEDIIITTKN	GKVRGMNLPV	LG	GGTVTAFLG

	40	50	60	70	80	90	100
human wt	IPYAQPPLGR	LRFKKPQSLT	KWSDIWNATK	YANSCCQNID	QSFPGFHGSE	MWNPNTDLSE	DCLYLNWVWP
human A	-----	-----	-----	-----G	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	IPYAQPPLGS	LRFKKPQPLN	KWPDVYNATK	YANSCYQNID	QAFPGFQSE	MWNPNTNLSE	DCLYLNWVWP
cat	IPYAQPPLGR	LRFKKPQFLT	KWSDIWNATK	YANSCYQNAD	QSFPGFPGSE	MWNPNTDLSE	DCLYLNWVWP
horse	IPYAQPPLGR	LRFKKPQSLT	KWSNIWNATK	YANSCYQNTD	QSFPGFLGSE	MWNPNTLSE	DCLYLNWVWP

	110	120	130	140	150	160	170
human wt	APKPKNATVL	IWIYGGGFQT	GTSSLHVYDG	KFLARVERVI	VVSMNYRVGA	LGFLALPGNP	EAPGNMGLFD
human A	-----	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	VPKPKNATVM	VWVYGGGFQT	GTSSLPVYDG	KFLTRVERVI	VVSMNYRVGA	LGFLAFPGNS	EAPGNMGLFD
cat	TPKPKNATVM	IWIYGGGFQT	GTSSLPVYDG	KFLARVERVI	VVSMNYRVGA	LGFLALPGNP	EVPGNMGLFD
horse	APKPKNATVM	IWIYGGGFQT	GTSSLPVYDG	KFLARVERVI	VVSMNYRVGA	LGFLALSEN	EAPGNMGLFD

	180	190	200	210	220	230	240
human wt	QQLALQWVQK	NIAAFGGNPK	SVTLFGESAG	AASVSLHLLS	PGSHSLFTRA	ILQSGSFNAP	WAVTSLYEAR
human A	-----	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	QQLALQWIQR	NIAAFGGNPK	SVTLFGESAG	AASVSLHLLC	PQSYPLFTRA	ILES	GSSNAP WAVKHPEEAR
cat	QQLALQWVQK	NIAAFGGNPK	SVTLFGESAG	AGSVSLHLLS	PRSQPLFTRA	ILQSGSSNAP	WAVMSLDEAK
horse	QQLALQWVQK	NIAAFGGNPR	SVTLFGESAG	AASVSLHLLS	PRSQPLFTRA	ILQSGSSNAP	WAVTSLYEAR

	250	260	270	280	290	300	310
human wt	NRTLNLAKLT	GCSRENETEI	IKCLRNKDPQ	EILLNEAFVV	PYGTPLSVNF	GPTVDGDFLT	DMPDILLELG
human A	-----	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	NRTLTLAKFI	GCSKENEKEI	ITCLRSKDPQ	EILLNEKLVL	PSDSIRSINF	GPTVDGDFLT	DMPHTLLQLG
cat	NRTLTLAKFI	GCSKENDTEI	IKCLRNKDPQ	EILLNELLVV	PSDTLLSVNF	GPVVDGDFLT	DMPDTLLQLG
horse	NRTLTLAKRM	GCSRDNETEM	IKCLRDNDPQ	EILLNEVFVV	PYDTLLSVNF	GPTVDGDFLT	DMPDTLLQLG

	320	330	340	350	360	370	380
human wt	QFKKTQILVG	VNKDEGTAFL	VYGAPGFSKD	NNSIITRKEF	QEGLKIFFPG	VSEFGKESIL	FHYTDWDDQ
human A	-----	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	KVKTAQILVG	VNKDEGTAFL	VYGAPGFSKD	NDSLITRREF	QEGLNMYFPG	VSSLGKEAIL	FYYVDWLGDQ
cat	QFKKTQILVG	VNKDEGTAFL	VYGAPGFSKD	NDSIITRKEF	QEGLKIYFPG	VSEFGREAIL	FYYVDLDDQ
horse	QFKRTQILVG	VNKDEGTAFL	VYGAPGFSKD	NNSIITRKEF	QEGLKIFFPR	VSEFGRESIL	FHYMDWLDDQ

FIGURE 4 (PAGE 1 OF 2)

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	390	400	410	420	430	440	450
human wt	RPENYREALG	DVVGDFNYFC	PALEFTKKFS	EWGNNAFFYY	FEHRSSKLPW	PEWMGVMHGY	EIEFVFGGLPL
human A	-----	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	TPEVYREALD	DIIGDYNIIIC	PALEFTKKFA	ELEINAFFYY	FEHRSSKLPW	PEWMGVMHGY	EIEFVFGGLPL
cat	RAEKYREALD	DVLGDYNIIC	PALEFTTKFS	ELGNNAFFYY	FEHRSSQLPW	PEWMGVMHGY	EIEFVFGGLPL
horse	RAENYREALD	DVVGDFNYIC	PALEFTTRKFS	ELGNDAFFYY	FEHRSTKLPW	PEWMGVMHGY	EIEFVFGGLPL

	460	470	480	490	500	510	520
human wt	ERRDNYTKAE	EILSRISIVKR	WANFAKYGNP	NETQNNSTSW	PVFKSTEQKY	LTLNTESTRI	MTKLRAQQCR
human A	-----	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----V-----	-----	-----
human K	-----	-----	-----	-----	-----	-----	-----
rat	ERRVNYTRAE	EIFRSIMKT	WANFAKYGHP	NGTQGNSTVW	PVFTSTEQKY	LTLNTEKSKI	NSKLRAQQCQ
cat	ERRVNYTRAE	EILSRSIMNY	WANFAKYGNP	NGTQNNSTRW	PAFRSTDQKY	LTLNAESPKV	YTKLRAQQCR
horse	ERRVNYTRAE	EILSRSIMKR	WANFAKYGNP	NGTQNNSTRW	PVFKSTEQKY	LTLNTEPKV	YTKLRAQQCR

	530	540	550	560	570	574
human wt	FWTSFFPKVL	EMTGNIDEAE	WEWKAGFHRW	NNYMDWKNQ	FNDYTSKKES	CVGL
human A	-----	-----	-----	-----	-----	-----
human J	-----	-----	-----	-----	-----	-----
human K	-----	-----T-----	-----	-----	-----	-----
rat	FWRLFFPKVL	EITGDIDERE	QEWKAGFHRW	SNYMDWKNQ	FNDYTSKKET	CTDL
cat	FWTLFFPKVL	EMTGNIDEAE	REWRAGFYRW	NNYMDWKNQ	FNDYTSKKES	CAGL
horse	FWTLFFPKVL	ELTGNIDEAE	REWKAGFHRW	NNYMDWKNQ	FNDYTSKKES	CSDF

FIGURE 4 (PAGE 2 OF 2)

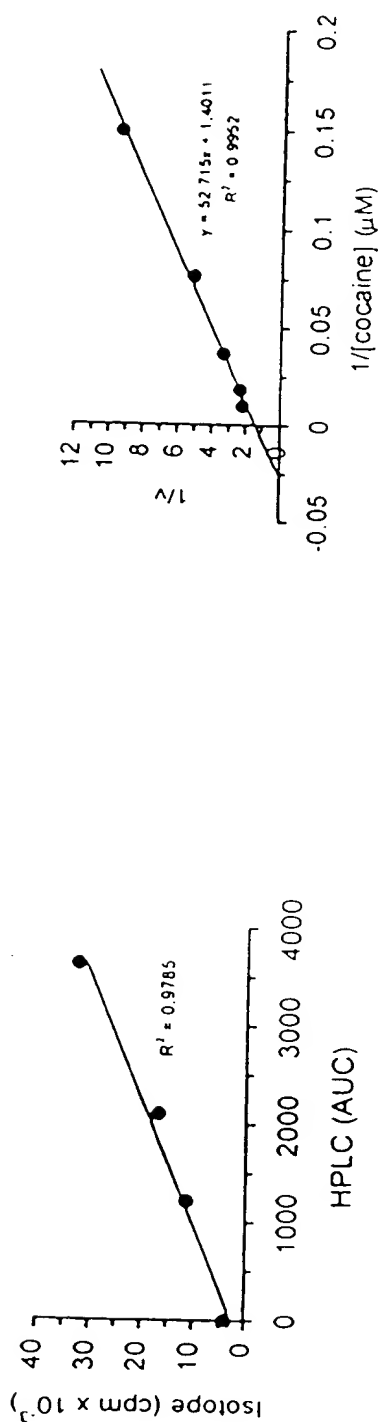


FIGURE 5

Inventors: Lockridge and Watkins  
Docket No.: P-IX 4143

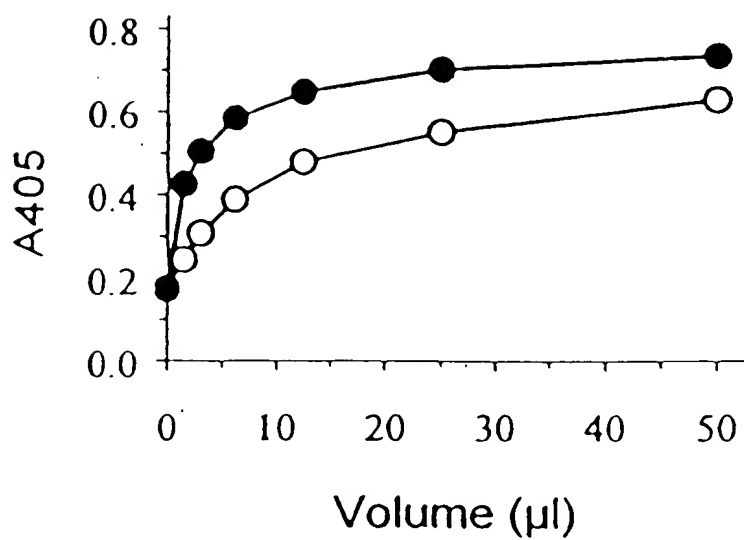


FIGURE 6

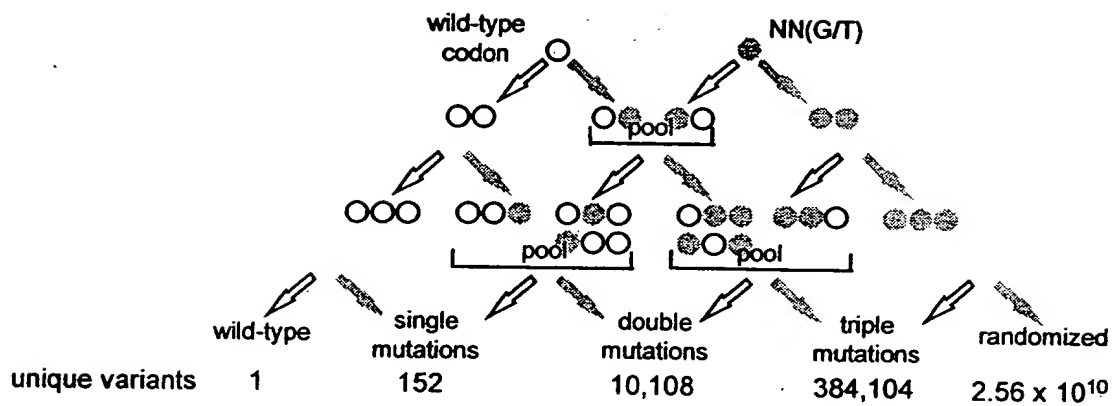


FIGURE 7